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Critical Review

819 Defective Endogenous Pain Modulation in Fibromyalgia: A Meta-Analysis of Temporal Summation and Conditioned Pain Modulation Paradigms

Anthony Terrence O'Brien, Alicia Deitos, Yolanda Triñanes Pego, Felipe Fregni, and Maria Teresa Carrillo-de-la-Peña

To study the characteristics of temporal summation and conditioned pain modulation in fibromyalgia patients, the authors searched Pubmed and EMBASE for studies using TS or CPM comparing FM patients to healthy controls. This novel meta-analysis provides evidence for defective endogenous pain modulation in fibromyalgia patients. The authors explored the impact of covariates on between study variability in these paradigms. These biomarkers may aid in diagnosis, and treatment of patients. However, validation requires further investigation under strict methodological settings, and into individual patient covariates.

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ON THE COVER

Generalized hyperalgesia and impaired pain modulation are reported in chronic low back pain (LBP). Few studies have tested whether these features are present in the acute phase. This study aimed to test for differences in pain presentation in early-acute LBP and evaluate the potential contribution of other factors to variation in sensitivity. The image shown portrays hierarchical clustering of patients based on principal component analysis, displayed as a heatmap and dendrogram in which the principal component scores are represented by shades of red (positive) and blue (negative). See Klyne et al, page 942.

Focus Article

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Research Agenda for the Prevention of Pain and Its Impact: Report of the Work Group on the Prevention of Acute and Chronic Pain of the Federal Pain Research Strategy

Robert J. Gatchel, David B. Reuben, Simon Dagenais, Dennis C. Turk, Roger Chou, Andrew D. Hershey, Gregory E. Hicks, John C. Licciardone, and Susan D. Horn

Following the 2011 Institute of Medicine report on chronic pain, the Interagency Pain Research Coordinating Committee (IPRCC) was created to enhance pain research efforts among federal agencies. The IPRCC and Office of Pain Policy at the National Institutes of Health collaborated to identify critical gaps in knowledge and address them through a strategic, long-term, Federal Pain Research Strategy (FPRS). The FPRS appointed interdisciplinary Work Groups to make research recommendations in five key areas. The article reports the results of one – the Prevention of Acute and Chronic Pain group. Several research priorities emerged, and recommendations were made to fill existing knowledge gaps.

Original Reports

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Neuropsychological Functioning and Treatment Outcomes in Acceptance and Commitment Therapy for Chronic Pain

Matthew Scott Herbert, Niloofar Afari, J.B. Robinson, Andrew Listvinsky, Mark W. Bondi, and Julie Loebach Wetherell

Neuropsychological (NP) performance has been associated with psychosocial treatment outcomes in non-pain conditions, but has never been investigated in chronic pain. The authors performed a secondary analysis on the association of baseline NP performance with treatment outcomes among veterans with chronic pain, undergoing an 8-week Acceptance and Commitment Therapy (ACT) intervention. Findings suggest that NP functioning is unrelated to changes in pain interference associated with ACT, and that those with relatively lower NP functioning may experience greater reductions in depressive symptoms and pain-related anxiety. This is important information for researchers and clinicians interested in cognition and chronic pain.

862 The Psychometric Properties of the FLACC Scale Used to Assess Procedural Pain

Dianne J. Crellin, Denise Harrison, Nick Santamaria, Hamidul Huque, and Franz E. Bahl

The Face, Legs, Activity, Cry and Consolability scale (FLACC) is one of the most commonly and widely used behavioral observation pain scales. The aim of this study was to test the psychometric and practical properties of the FLACC scale to quantify procedural pain in infants and young children. Twenty-six clinicians applied the FLACC scale to segments of video collected from 100 children undergoing a procedure. Findings provide evidence that the FLACC scale is reliable and sensitive to pain for procedural pain assessment. Concerns remain about specificity and scale design. Identification of a scale valid for this purpose is needed to provide a platform for improved procedural pain management in infants and young children.

873 Pain Sensitivity and Thermal Detection Thresholds in Young Adults Born Preterm With Very Low Birth Weight or Small for Gestational Age at Term Compared With Controls

Johanne Marie Iversen, Martin Uglem, Marit Sæbø Indredavik, Pål Richard Romundstad, Kristian Bernhard Nilsen, Trond Sand, and Marite Rygg

The objective of this prospective long-term follow-up study was to investigate whether somatosensory function is altered among individuals born preterm with very low birth weight (VLBW); or small for gestational age. Within the VLBW group, neonatal mechanical ventilation was associated with reduced sensitivity to cool, and length of mechanical ventilation correlated with lower pressure pain thresholds. This is the first report on thermal and pain sensitivity among young adults born preterm with very low birth weight or small for gestational age at term. The negative results oppose previous findings of altered sensory perception among children and adolescents born preterm.

885 Prevalence and Pharmaceutical Treatment of Plantar Fasciitis in United States Adults

Richard L. Nahin

This study provides prevalence estimates of plantar fasciitis in United States adults, as well as the types and frequencies of pharmaceutical treatment specifically for this pain. Data are from the 2013 National Health and Wellness Survey, a large internet panel survey designed to approximate the adult population. This work provides additional insights into the pain and disability associated with plantar fasciitis, as well as the pharmaceutical treatments being used for its management. Both prescription and over-the-counter medications are used to manage plantar fasciitis symptoms despite limited, if any, clinical trial data supporting their use.

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Pain Adaptability in Individuals With Chronic Musculoskeletal Pain Is Not Associated With Conditioned Pain Modulation

Dawn Wong Lit Wan, Lars Arendt-Nielsen, Kelun Wang, Charlie Changli Xue, Yanyi Wang, and Zhen Zheng

Healthy humans can be divided into the pain adaptive (PA) and the pain non-adaptive (PNA) groups; PA showed a greater decrease in pain rating to a cold pressor test than PNA. This study examined if the dichotomy of pain adaptability existed in individuals with chronic musculoskeletal pain (MSK). The dichotomy of pain adaptability exists in MSK patients. Pain adaptability could be another form of endogenous pain inhibition of which clinical implication is yet to be understood. Similar to the healthy human study, pain adaptability is not associated with conditioned pain modulation, and may reflect the temporal aspect of pain inhibition.

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Effect on Health Care Costs for Adolescents Receiving Adjunctive Internet-Delivered Cognitive-Behavioral Therapy: Results of a Randomized Controlled Trial

Emily F. Law, Cornelius B. Groenewald, Chuan Zhou, and Tonya M. Palermo

The economic burden of pediatric chronic pain is high, with an estimated annual cost of \$19.5 billion. Little is known about whether psychological treatment for pediatric chronic pain can alter health care utilization. This secondary data analysis aimed to evaluate the effect of adjunctive internet cognitive-behavioral therapy intervention (I-CBT) or adjunctive internet education (I-EDU) on health care-related costs adolescents with chronic pain recruited from interdisciplinary clinics. Results show that expenditures decreased significantly in youth with chronic pain from the year prior to initiating treatment to the following year in both intervention conditions, adjunctive internet cognitive-behavioral therapy and adjunctive internet education. Contrary to our hypothesis, the rate of change in health care costs over time was not significantly different between intervention conditions.

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Qualitative and Quantitative Aspects of Pain in Patients With Myotonic Dystrophy Type 2

Judith van Vliet, Alide A. Tieleman, Aad Verrips, Hans Timmerman, Robert T.M. van Dongen, Baziel G.M. van Engelen, and Oliver H.G. Wilder-Smith

Pain is a common but often ignored symptom in patients with myotonic dystrophy type 2 (DM2). This explorative study assessed qualitative and quantitative aspects of pain in DM2 by means of four questionnaires and quantitative sensory testing. Both a disease control group (fibromyalgia [FMS]) and healthy controls were used to compare the results, as pain in DM2 shows many clinical similarities to pain in FMS. These results confirm that pain is a frequent and important symptom in patients with DM2, affecting quality of life. Peripheral mechanisms of pain seem to play a role in DM2. The widespreadness of the hyperalgesia suggests central sensitization, but this finding was not supported by the other results. This study opens new avenues for further research and eventually novel treatment strategies, both in DM2 as well as other muscular disorders.

931 Traumatic Brain Injury and Receipt of Prescription Opioid Therapy for Chronic Pain in Iraq and Afghanistan Veterans: Do Clinical Practice Guidelines Matter?

Karen H. Seal, Daniel Bertenthal, Deborah E. Barnes, Amy L. Byers, Carolyn J. Gibson, Tessa L. Rife, and Kristine Yaffe and the Chronic Effects of Neurotrauma Consortium Study Group

Clinical practice guidelines admonish against prescribing opioids for individuals with chronic pain and traumatic brain injury (TBI), given increased risk for adverse outcome. However, no studies have described prescribing patterns in higher risk patients. More than 50,000 Iraq and Afghanistan veterans with chronic pain not prescribed opioids in the previous year were followed for one year after completing a Comprehensive TBI Evaluation within Department of Veterans Affairs health care facilities. Paradoxically, findings suggest that veterans with greater traumatic brain injury (TBI) severity and comorbid mental health burden are more likely to be prescribed opioids for chronic pain. More vulnerable veterans may benefit from improved access to behavioral health and non-pharmacological modalities for chronic pain, given the health and safety risks of opioids.

942 Individual Variation in Pain Sensitivity and Conditioned Pain Modulation in Acute Low Back Pain: Effect of Stimulus Type, Sleep, and Psychological and Lifestyle Factors 

David M. Klyne, G. Lorimer Moseley, Michele Sterling, Mary F. Barbe, and Paul W. Hodges

Generalized hyperalgesia and impaired pain modulation are reported in chronic low back pain (LBP). Few studies have examined whether these features are present in the acute phase. This study tested for differences in pain in early-acute LBP and evaluate the potential contribution of other factors to variation in sensitivity. Results provide evidence for generalized hyperalgesia in many individuals during acute LBP, with variation accounted for by several factors. Sensory changes indicative of increased/decreased central processing and nociceptive input presented differently between individuals, and were related to factors such as sleep and alcohol. This may underlie variation in outcome and suggest potential for early identification of individuals with poor long-term outcome.

Assessment of Responsiveness to Everyday Non-Noxious Stimuli in Pain-Free Migraineurs With Versus Without Aura

Yelena Granovsky, Merav Shor, Alla Shifrin, Elliot Sprecher, David Yarnitsky, and Tami Bar-Shalita

Migraineurs with aura (MWA) express higher inter-ictal response to non-noxious and noxious experimental sensory stimuli compared to migraineurs without aura (MWOA), but whether these differences also prevail in response to everyday non-noxious stimuli is not yet explored. This study tested 53 female migraineurs who underwent testing at pain-free phase, and completed a sensory responsiveness questionnaire and pain-related psychological questionnaires. MWA express higher everyday sensory responsiveness than MWOA, in line with higher response to experimental noxious stimuli. Abnormal scores of sensory responsiveness characterize people with Sensory Modulation Dysfunction, suggesting possible underlying mechanisms overlap, and possibly incidence of both clinical entities.

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